

CLAIMS:**WHAT IS CLAIMED IS:**

1. A refrigerating apparatus comprising: a refrigerant circuit (20) which includes a
5 utilization side heat exchanger (101, 111, 131) and a heat source side compressor (41, 42,
43) and through which refrigerant is circulated to effect a vapor compression refrigeration
cycle; and a cooling fluid circuit (220) which includes a supercool heat exchanger (210)
and a pump mechanism (221) which delivers cooling fluid to the supercool heat exchanger
(210), wherein refrigerant which is supplied to the utilization side heat exchanger (101, 111,
10 131) is supercooled by cooling fluid in the supercool heat exchanger (210),
the refrigerating apparatus further comprising control means (240) which reduces
the power consumption of the pump mechanism (221) either based on the state of
refrigerant of the refrigerant circuit (20) flowing through the supercool heat exchanger
(210) or based on the state of cooling fluid of the cooling fluid circuit (220) and the
15 temperature of outside air.
2. The refrigerating apparatus of claim 1, wherein:
the control means (240) is configured to estimate power consumption relating to
the refrigerant circuit (20) either based on the state of refrigerant of the refrigerant circuit
20 (20) flowing through the supercool heat exchanger (210) or based on the state of cooling
fluid of the cooling fluid circuit (220) and the temperature of outside air, whereby the
power consumption of the pump mechanism (221) is reduced.
3. The refrigerating apparatus of claim 1, wherein:
25 the cooling fluid circuit is a supercool refrigerant circuit (220) which includes a
supercool compressor (221) as a pump mechanism and a heat source side heat exchanger
(222) and through which supercool refrigerant as cooling fluid is circulated to effect a
vapor compression refrigeration cycle, and

the control means (240) is configured to reduce the power consumption of the supercool compressor (221) by lowering the operating frequency of the supercool compressor (221) either based on the state of refrigerant of the refrigerant circuit (20) flowing through the supercool heat exchanger (210) or based on the state of supercool refrigerant of the supercool refrigerant circuit (220) and the temperature of outside air.

4. The refrigerating apparatus of claim 1, wherein:

the cooling fluid circuit is a supercool refrigerant circuit (220) which includes a supercool compressor (221) as a pump mechanism and a heat source side heat exchanger (222) and through which supercool refrigerant as cooling fluid is circulated to effect a vapor compression refrigeration cycle, and

the control means (240) is configured to reduce the power consumption of the supercool compressor (221) by increasing the operating frequency of a fan (230) of the heat source side heat exchanger (222) either based on the state of refrigerant of the refrigerant circuit (20) flowing through the supercool heat exchanger (210) or based on the state of supercool refrigerant of the supercool refrigerant circuit (220) and the temperature of outside air.

5. The refrigerating apparatus of claim 1 or claim 2, wherein:

the state of refrigerant of the refrigerant circuit (20) flowing through the supercool heat exchanger (210) is the degree of supercooling of refrigerant of the refrigerant circuit (20) in the supercool heat exchanger (210).

6. The refrigerating apparatus of claim 1 or claim 2, wherein:

the state of refrigerant of the refrigerant circuit (20) flowing through the supercool heat exchanger (210) is the flow rate of refrigerant of the refrigerant circuit (20) flowing through the supercool heat exchanger (210).

7. The refrigerating apparatus of claim 1 or claim 2, wherein:

the state of cooling fluid of the cooling fluid circuit (220) is the difference between temperatures of cooling fluid prior to and after supercooling of refrigerant of the refrigerant circuit (20) in the supercool heat exchanger (210).

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8. The refrigerating apparatus of claim 1 or claim 2, wherein:

the state of cooling fluid of the cooling fluid circuit (220) is the flow rate of cooling fluid flowing through the supercool heat exchanger (210).

10 9. The refrigerating apparatus of claim 1 or claim 2, wherein:

the cooling fluid circuit is a supercool refrigerant circuit (220) which includes a supercool compressor (221) as a pump mechanism and a heat source side heat exchanger (222) and through which supercool refrigerant as cooling fluid is circulated to effect a vapor compression refrigeration cycle, and

15 the state of supercool refrigerant of the supercool refrigerant circuit (220) is the high pressure of supercool refrigerant in the supercool refrigerant circuit (220).

10. The refrigerating apparatus of claim 1 or claim 2, wherein:

the cooling fluid circuit is a supercool refrigerant circuit (220) which includes a
20 supercool compressor (221) as a pump mechanism and a heat source side heat exchanger (222) and through which supercool refrigerant as cooling fluid is circulated to effect a vapor compression refrigeration cycle, and

the state of supercool refrigerant of the supercool refrigerant circuit (220) is the
pressure difference between the high pressure and the low pressure of supercool refrigerant
25 in the supercool refrigerant circuit (220).

11. A refrigerating apparatus comprising: a refrigerant circuit (20) which includes a utilization side heat exchanger (101, 111, 131) and a heat source side compressor (41, 42,

43) and through which refrigerant is circulated to effect a vapor compression refrigeration cycle; and a cooling fluid circuit (220) which includes a supercool heat exchanger (210) and a pump mechanism (221) which delivers cooling fluid to the supercool heat exchanger (210), wherein refrigerant which is supplied to the utilization side heat exchanger (101, 111, 5 131) is supercooled by cooling fluid in the supercool heat exchanger (210),

the refrigerant apparatus further comprising control means (240) which controls power consumption relating to the refrigerant circuit (20) and power consumption relating to the cooling fluid circuit (220), and

the control means (240) increasing the power consumption of the cooling fluid 10 circuit (220) in preference to the refrigerant circuit (20), when there is an increase in load.

12. The refrigerating apparatus of claim 11, wherein:

the control means (240) is configured to control power consumption relating to the cooling fluid circuit (220) so that the temperature of refrigerant at an outlet of the 15 supercool heat exchanger (210) becomes a target value, and to set the target value based on the ambient condition of the supercool heat exchanger (210) so that the power consumption of the cooling fluid circuit (220) is preferentially increased when there is an increase in load.

20 13. The refrigerating apparatus of claim 11, wherein:

the control means (240) is configured to increase the power consumption of the pump mechanism (221) to thereby preferentially increase the power consumption of the cooling fluid circuit (220).

25 14. The refrigerating apparatus of claim 13, wherein:

the cooling fluid circuit is a supercool refrigerant circuit (220) which includes a supercool compressor (221) as a pump mechanism and a heat source side heat exchanger (222) and through which supercool refrigerant as cooling fluid is circulated to effect a

vapor compression refrigeration cycle, and

the control means (240) is configured to increase the operating frequency of the supercool compressor (221) to thereby increase the power consumption of the supercool compressor (221).

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15. The refrigerating apparatus of claim 11, wherein:

the cooling fluid circuit is a supercool refrigerant circuit (220) which includes a supercool compressor (221) as a pump mechanism and a heat source side heat exchanger (222) and through which supercool refrigerant as cooling fluid is circulated to effect a

10 vapor compression refrigeration cycle, and

the control means (240) is configured to increase the operating frequency of a fan (230) of the heat source side heat exchanger (222) to thereby preferentially increase the power consumption of the supercool refrigerant circuit (220).

15 16. The refrigerating apparatus of claim 12, wherein:

the ambient condition of the supercool heat exchanger (210) is the temperature of outside air.

17. The refrigerating apparatus of claim 12, wherein:

20 the ambient condition of the supercool heat exchanger (210) is the degree of supercooling of refrigerant of the refrigerant circuit (20) in the supercool heat exchanger (210).

18. The refrigerating apparatus of claim 12, wherein:

25 the ambient condition of the supercool heat exchanger (210) is the flow rate of refrigerant of the refrigerant circuit (20) flowing through the supercool heat exchanger (210).

19. The refrigerating apparatus of claim 12, wherein:

the ambient condition of the supercool heat exchanger (210) is the difference between temperatures of cooling fluid of the cooling fluid circuit (220) prior to and after supercooling of refrigerant of the refrigerant circuit (20) in the supercool heat exchanger (210).

20. The refrigerating apparatus of claim 12, wherein:

the ambient condition of the supercool heat exchanger (210) is the flow rate of cooling fluid of the cooling fluid circuit (220) flowing through the supercool heat exchanger (210).

21. The refrigerating apparatus of claim 12, wherein:

the cooling fluid circuit is a supercool refrigerant circuit (220) which includes a supercool compressor (221) as a pump mechanism and a heat source side heat exchanger (222) and through which supercool refrigerant as cooling fluid is circulated to effect a vapor compression refrigeration cycle, and

the ambient condition of the supercool heat exchanger (210) is the high pressure of supercool refrigerant in the supercool refrigerant circuit (220).

22. The refrigerating apparatus of claim 12, wherein:

the cooling fluid circuit is a supercool refrigerant circuit (220) which includes a supercool compressor (221) as a pump mechanism and a heat source side heat exchanger (222) and through which supercool refrigerant as cooling fluid is circulated to effect a vapor compression refrigeration cycle, and

the ambient condition of the supercool heat exchanger (210) is the pressure difference between the high pressure and the low pressure of supercool refrigerant in the supercool refrigerant circuit (220).

23. The refrigerating apparatus of claim 16, wherein:
the control means (240) is configured to decrease the target value as the temperature of outside air increases.

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